

10/16/00
10948 U.S. PTO10-17-00
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**UTILITY
PATENT APPLICATION
TRANSMITTAL**

(Only for new nonprovisional applications under 37 C.F.R. § 1.53(b))

Attorney Docket No. MOT-D2006C1

First Inventor or Application Identifier Gresko et al.

Title CATV DIRECTIONAL COMPONENT WITH SIGNAL REVERSING CAPABILITY AND
METHOD

Express Mail Label No. EL703380117

APPLICATION ELEMENTS

See MPEP chapter 600 concerning utility patent application contents

1. * Fee Transmittal Form (e.g., PTO/SB/17)
(Submit an original and a duplicate for fee processing)
2. Specification [Total Pages 13]
(preferred arrangement set forth below)
 - Descriptive title of the Invention
 - Cross References to Related Applications
 - Statement Regarding Fed sponsored R & D
 - Reference to Microfiche Appendix
 - Background of the Invention
 - Brief Summary of the Invention
 - Brief Description of the Drawings (if filed)
 - Detailed Description
 - Claim(s)
 - Abstract of the Disclosure
3. Drawing(s) (35 U.S.C. 113) [Total Sheets 7]
4. Oath or Declaration [Total Pages 3]
 - a. Newly executed (original or copy)
 - b. Copy from a prior application (37 C.F.R. § 1.63(d))
(for continuation/divisional with Box 16 completed)
 - i. DELETION OF INVENTOR(S)
Signed statement attached deleting
inventor(s) named in the prior application,
see 37 C.F.R. §§ 1.63(d)(2) and 1.33(b).

* NOTE FOR ITEMS 1 & 13: IN ORDER TO BE ENTITLED TO PAY SMALL ENTITY FEES, A SMALL ENTITY STATEMENT IS REQUIRED (37 C.F.R. § 1.27), EXCEPT IF ONE FILED IN A PRIOR APPLICATION IS RELIED UPON (37 C.F.R. § 1.28).

ADDRESS TO: Commissioner for Patents
Box Patent Application
Washington, DC 20231

5. Microfiche Computer Program (Appendix)
6. Nucleotide and/or Amino Acid Sequence Submission
(if applicable, all necessary)
 - a. Computer Readable Copy
 - b. Paper Copy (identical to computer copy)
 - c. Statement verifying identity of above copies

ACCOMPANYING APPLICATION PARTS

7. Assignment Papers (cover sheet & document(s))
8. 37 C.F.R. § 3.73(b) Statement Power of
(when there is an assignee) Attorney
9. English Translation Document (if applicable)
10. Information Disclosure Statement (IDS)/PTO-1449 Copies of IDS
Statement (IDS)/PTO-1449 Citations
11. Preliminary Amendment
12. Return Receipt Postcard (MPEP 503)
(Should be specifically itemized)
13. * Small Entity Statement(s) Statement filed in prior application,
(PTO/SB/09-12) Status still proper and desired
14. Certified Copy of Priority Document(s)
(if foreign priority is claimed)
15. Other: See Attached Schedule A.....

16. If a CONTINUING APPLICATION, check appropriate box, and supply the requisite information below and in a preliminary amendment:

Continuation Divisional Continuation-in-part (CIP) of prior application No: 09/228,141

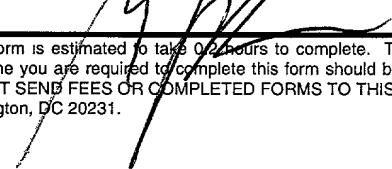
Prior application information: Examiner K. Bui Group / Art Unit: 2711

For CONTINUATION or DIVISIONAL APPS only: The entire disclosure of the prior application, from which an oath or declaration is supplied under Box 4b, is considered a part of the disclosure of the accompanying continuation or divisional application and is hereby incorporated by reference. The incorporation can only be relied upon when a portion has been inadvertently omitted from the submitted application parts.

17. CORRESPONDENCE ADDRESS

Customer Number or Bar Code Label 24375
(Insert Customer No. or Attach bar code label here) or Correspondence address below

Name	Volpe and Koenig, P.C.		
	DEPT MOT		
Address			
City	State	Zip Code	
Country	Telephone	Fax	

Name (Print/Type)	Gerald B. Halt, Jr., Esquire	Registration No. (Attorney/Agent)	37,633
Signature		Date	10/16/00

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Schedule A

16. Other:

- With respect to the drawings, Applicant submits herewith seven (7) sheets of informal drawings as originally filed and seven (7) sheets of formal drawings; and
- A check in the amount of \$710.

DO NOT FILE THIS DOCUMENT

Volpe and Koenig, P.C. Revision of PTO/SB/17 (08-00)
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FEE TRANSMITTAL for FY 2000

Patent fees are subject to annual revision.

TOTAL AMOUNT OF PAYMENT	(\$)	710
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Complete if Known

Application Number	Not Yet Known
Filing Date	Not Yet Known
First Named Inventor	Gresko et al.
Examiner Name	Not Yet Known
Group Art Unit	Not Yet Known
Attorney Docket No.	MOT-D2006C1

METHOD OF PAYMENT (check one)

1. The Commissioner is hereby authorized to charge indicated fees and credit any overpayments to:

Deposit Account Number **22-0493**
 Deposit Account Name **Volpe and Koenig, P.C.**

Charge Any Deficiency or Credit any Overpayment in the Total Fees Associated with this Communication

Applicant claims small entity status
See 37 CFR 1.27

2. Payment Enclosed:

Check Credit card Money Order Other

FEE CALCULATION (continued)

3. ADDITIONAL FEES

Large Entity	Small Entity	Fee Description	Fee Paid
Fee Code (\$)	Fee Code (\$)		
105	130	205	65
127	50	227	25
139	130	139	130
147	2,520	147	2,520
112	920*	112	920*
113	1,840*	113	1,840*
115	110	215	55
116	390	216	195
117	890	217	445
118	1,390	218	695
128	1,890	228	945
119	310	219	155
120	310	220	155
121	270	221	135
138	1,510	138	1,510
140	110	240	55
141	1,240	241	620
142	1,240	242	620
143	440	243	220
144	600	244	300
122	130	122	130
123	50	123	50
126	240	126	240
581	40	581	40
146	710	246	355
149	710	249	355
179	710	279	355
169	900	169	900
Other fee (specify) _____			
* Reduced by Basic Filing Fee Paid			
SUBTOTAL (3) (\$0)			

FEE CALCULATION

1. BASIC FILING FEE

Large Entity	Small Entity	Fee Description	Fee Paid
Fee Code (\$)	Fee Code (\$)		
101	710	201	355
106	320	206	160
107	490	207	245
108	710	208	355
114	150	214	75
SUBTOTAL (1) (\$710)			

2. EXTRA CLAIM FEES

Total Claims	Extra Claims	Fee from below	Fee Paid
11	-20** = 0	X 18 = 0	= 0
Independent Claims 3	-3 ** = 0	X 80 = 0	= 0
Multiple Dependent			

**or number previously paid, if greater; For Reissues, see below

Large Entity	Small Entity	Fee Description
Fee Code (\$)	Fee Code (\$)	
103	18	203
102	80	202
104	270	204
109	80	209
110	18	210
SUBTOTAL (2) (\$0)		

SUBMITTED BY

Complete (if applicable)

Name (Print/Type)	Gerald B. Halt, Jr. Esquire	Registration No. (Attorney/Agent)	37,633	Telephone	215-568-6400
Signature				Date	10/16/00

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CATV DIRECTIONAL COMPONENT WITH SIGNAL

REVERSING CAPABILITY AND METHOD

BACKGROUND OF THE INVENTION

Field of the Invention

5 This invention relates generally to cable television communication system passive distribution components. More particularly, the invention relates to a signal tap having a housing frame which allows for signal distributing circuitry to be interchanged from either side of the housing frame thereby easily reversing signal direction without disconnection from the CATV coaxial signal cable.

Description of the Prior Art

10 Cable television (CATV) services are provided to customers through a transmission network that typically includes a trunk system transporting a plurality of CATV services from a headend to smaller branches and then onto individual subscriber drops. The transmission medium for the branch and subscriber drops is usually coaxial cable. The transmission network typically includes active and passive components, i.e., line amplifiers, cable taps, cable 15 splitters, and other equipment to distribute the CATV services.

20 At a subscriber location, the coaxial cable is interrupted with a signal tap which distributes the CATV services to a number of individual subscribers. The signal tap is connected to the

coaxial cable using F-connectors and is supported by the cable support strand or a pedestal.

A block diagram of a cable television network 15 is shown in **Figure 1**. The coaxial cable 17 functions as a transmission line to provide CATV services 19 to a number of subscribers 21 at various locations. Each subscriber 21 receives signals through the individual taps 23 placed on the coaxial cable 17. Each tap 23 may provide multiple connections.

A prior art signal tap 23 is shown in **Figure 2**. The tap 23 includes a body 25, a tap cover 27, a printed circuit board 29 with loss circuitry and asymmetrical connectors 31. The tap cover 27 is provided with a plurality of tap outlets 33, each providing service to a different subscriber 21. The body 25 includes threaded, female F-connector signal input 35 and output 36 ports at opposing ends for connection to the CATV distribution cable 17. The body 25 includes an integral support strand clamp 39 cast in place.

The CATV signal 19 is routed through the printed circuit board 29 rigidly attached to the inside surface of the cover 27 with a plurality of signal tap terminals 41 passing through the cover 27. A pair of signal receptors 43a, 43b are provided on the back of the printed circuit board 29. The printed circuit board 29 distributes the signal received from the headend 19 to subscribers 21 coupled to that tap 23 and passes the signal through to the output connector 36. Since subscriber tap 23 loss circuitry 29 is directional with regard to predetermined frequency bandwidths and the location of the headend, the signal has to enter the input

receptor 43a and exit the output receptor 43b in the direction indicated on the tap cover 27. A detailed explanation of the function of the loss circuitry 29 is beyond the scope of the present invention. A metal braid and flexible gasket surrounds the 5 periphery of the tap cover 27 to provide a seal for weather and EMI/RFI ingress.

The tap cover 27 and the printed circuit board 29 are secured to the main body 35 by a plurality of cover bolts at various connection points 45. Upon engagement of the cover, the pair of 10 receptors 43a, 43b engage the connectors 31 thereby completing the circuit and maintaining continuity from the input connector 35 through the printed circuit board 29 distributing the signal to each signal tap 33 and to the output signal port 36 to other downstream subscribers 23.

Periodically, when CATV distribution systems are modernized or rebuilt to higher frequency specifications, the origin of the signal may change necessitating the reversal of the signal connections for each signal tap. As shown in Figure 3, to reverse 15 frequency direction 50, the coaxial cable connections 47a, 47b on the signal tap 23 must be broken and the tap 23 removed from the support strand 49. The tap 23 must be turned 180 degrees and reconnected to the coaxial cable connections 47a, 47b and support 20 strand 49. By breaking the connections to the coaxial cable 17, potential damage to the connectors 47a, 47b may result.

It is desirable to have a signal tap that easily allows the reversal of signal direction without needing to break the coaxial cable connections.

SUMMARY OF THE INVENTION

5 The present invention provides a CATV signal tap having a housing frame where the external coaxial signal cable connections are made allowing for the tap circuitry to be placed on either side of the frame effecting a reversal of signal direction without breaking the CATV coaxial signal cable connections. The signal tap comprises a housing frame, a back cover with an integral support clamp and a signal tap cover with a plurality of female F-connectors. The loss circuitry is mounted on a PC board that is affixed internal to the signal tap cover. The present invention allows for the rapid exchange between the signal tap cover and rear cover allowing easy signal direction reversal.

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Accordingly, it is an object of the invention to provide a signal tap which allows for easy signal direction reversal.

It is a further object of the invention to obviate breaking the external CATV coaxial signal cable connections for a signal tap if signal direction reversal is desired.

Other objects and advantages of the invention will become apparent to those skilled in the art after reading the detailed description of the preferred embodiment.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is a system block diagram of a typical cable television subscriber feed.

Figure 2 is an exploded perspective view of a prior art signal tap.

5 Figure 3 is a perspective view of a signal tap suspended on a support strand.

Figure 4 is an exploded perspective view of the present invention.

10 Figure 5 is a front elevation view of the housing frame for the present invention.

Figure 6 is an exploded perspective view of a seizure post.

Figure 7 is a front elevation view of the housing frame showing the seizure posts in position.

Figure 8 is a cross sectional view along line 8-8 in Figure 7.

15 Figure 9 is a rear elevation view of the housing frame showing the seizure posts in position.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

The preferred embodiment will be described with reference to the drawing figures where like numerals represent like elements throughout.

20 The present invention 51 is shown in Figures 4-9. Referring to Figure 4, the signal tap 51 includes a housing frame 53, a signal tap cover 55 and a rear cover 57. The signal tap cover 55 has signal distribution circuitry rigidly attached (not shown).
25 The rear cover 57 has an integral cast support bracket (not shown)

for aerial (strand) or pedestal support. Each side of the housing frame 53 of the signal tap 51 is symmetric with respect to the mounting holes 59 for the front 55 and rear 57 covers allowing for either cover 55, 57 to be placed on either side of the housing frame 53. The mounting hole 61 located between the input 63 and output 65 coaxial cable connectors is offset 67 such that the front 55 and rear covers 57 can only be mounted to the housing frame 53 in one orientation.

As can be seen in **Figure 4**, the front 55 and rear covers 57 may be interchanged freely thereby allowing for rapid signal direction 50 reversal. In conjunction with the covers mating to either side of the housing frame 53, internal seizure posts 69 similarly provide symmetric engagement from either side of the housing frame 53 (see **Figures 7 and 9**).

Referencing **Figure 5**, tapped mounting blocks 71 integrally cast with the housing frame 53 support the symmetric seizure posts 69. The seizure posts 69 are secured to the mounting blocks 71 with machine screws 73. The seizure posts 69 are used to couple the CATV coaxial cable 17 F-connectors 47a, 47b and provide mating engagement and circuit continuity with the PC board 29 (shown in **Figure 2**).

As shown in **Figure 6**, the seizure post 69 includes a split insulator 75 and a conducting clamp arrangement 77 that includes a screw hold-down 79 which captures the center conductor of the CATV coaxial cable 17 F-connector 47a, 47b. Symmetric female connectors 81a, 81b extending beyond the insulating body 75 engage with male

input 43a and output 43b signal receptors located on the PC board 29 (shown in **Figure 2**). The female connectors 81a, 81b allow for mating engagement on either side of the housing frame 53 as shown in **Figure 8**. Referencing **Figures 7 and 9**, the front view and rear 5 view of the tap housing frame 53 with the seizure posts secured to the housing frame show that the seizure posts provide mating engagement on either side of the housing frame 53 with the PC board signal receptors 43a, 43b. The present invention 51 allows for the rapid exchange of the tap (front) and rear covers reversing signal 10 50 direction.

While the present invention has described in terms of the preferred embodiment, other variations which are within the scope of the invention as outlined in the claims below will be apparent to those skilled in the art.

* * *

What is claimed is:

1. A directional component for distributing directional rf signals impressed on a coaxial cable that allows for frequency direction reversal comprising:

5 a housing frame having first and second signal ports each for either the input or output of a directional rf signal;

each signal port having an internal coupling means;

10 a signal tap subcomponent having at least one external tap outlet and having an input receptor and an output receptor for operative association with the internal coupling means of said first and second signal ports; and

15 said internal coupling means of said first and second signal ports configured for operative association with said input and output receptors of said signal tap subcomponent to provide a first mounting position where said input receptor is coupled to said first signal coupling means and said output receptor is coupled to said second signal port coupling means and a second mounting position where said input receptor is coupled to said second signal port coupling means and said output receptor is coupled to said first signal port coupling means.

2. The directional component according to claim 1 wherein each of said coupling means further comprise:

a symmetrical seizure post having a split insulator and a conducting clamp; and

5 said conducting clamp having a screw hold-down for capturing
a center conductor of the coaxial cable.

3. The directional component according to claim 2 wherein
said housing frame further comprises two open sides and said signal
tap subcomponent seals one open side of said housing frame and a
cover seals said open housing frame side not covered by said signal
5 tap subcomponent.

4. A directional signal distributing component used in
conjunction with rf signals impressed on a coaxial cable that
allows for frequency direction reversal comprising:

 a housing frame having first and second signal ports each for
either the input or output of a directional rf signal;

 each signal port having an internal coupling means; and

 said internal coupling means of said first and second signal
ports configured for operative association with input and output
receptors of a directional subcomponent to provide a first mounting
position where the subcomponent input receptor is coupled to said
first signal port coupling means and said output receptor is
coupled to said second signal port coupling means and a second
mounting position where the subcomponent input receptor is coupled
to said second signal port coupling means and the subcomponent
15 output receptor is coupled to said first signal port coupling
means.

5. The directional signal component according to claim 4
wherein said housing frame has two open sides further comprising
a directional subcomponent mounted in one of said mounting
positions and sealing one open side of said housing frame and a
5 cover mounted in sealing engagement over the other open housing
frame side.

6. The directional signal component according to claim 4
wherein each of said coupling means further comprise:

a symmetrical seizure post having a split insulator and
a conducting clamp; and
said conducting clamp having a screw hold-down for capturing
a center conductor of the coaxial cable.

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5. The directional signal component according to claim 6
wherein said housing frame has two open sides further comprising
a directional subcomponent mounted in one of said mounting
positions and sealing one open side of said housing frame and a
cover mounted in sealing engagement over the other open housing
frame side.

8. A method of reversing the frequency direction of a
directional component for distributing directional rf signals
impressed on a coaxial cable which includes a housing frame having
first and second signal ports and a directional subcomponent having

5 an input and an output signal receptor, the method comprising the
steps of:

providing first and second symmetrical couplings, said
couplings individually associated with the first and second ports,
respectively, and having the subcomponent input receptor coupled to
10 said first coupling and the subcomponent output receptor coupled to
said second coupling whereby said first port functions as an input
of the directional component and said second port functions as an
output of the directional component;

15 decoupling the directional subcomponent from said first and
second couplings; and

recoupling the directional subcomponent such that the
subcomponent input receptor is coupled to said second coupling and
the subcomponent output receptor is coupled to said first coupling
whereby the second port functions as an input for the directional
20 component and the first port functions as an output for the
directional component.

9. The method according to claim 8 wherein a first coaxial
cable is coupled to the first port and a second coaxial cable is
coupled to the second port and the steps of the method are
conducted without decoupling said coaxial cables.

10. The method according to claim 8 wherein the housing frame
has first and second open sides and the subcomponent is in sealing

engagement with one of said open sides when the subcomponent receptors are coupled with said couplings, further comprising:

5 providing a sealing cover sealingly mounted over the housing open side opposite the side covered by the subcomponent when the subcomponent input receptor is coupled to said first coupling and the subcomponent output receptor is coupled to said second coupling;

10 removing said sealing cover; and

mounting said sealing cover over the housing open side opposite the side covered by the directional subcomponent when the subcomponent input receptor is coupled to said second coupling and the subcomponent output receptor is coupled to said first coupling.

11. The method according to claim 10 wherein a first coaxial cable is coupled to the first port and a second coaxial cable is coupled to the second port and the steps of the method are conducted without decoupling said coaxial cables.

ABSTRACT

The present invention describes a directional CATV component, preferably a signal tap, having a housing frame where coaxial signal cable connections are made allowing for tap circuitry to be
5 placed on either side of the housing frame. The invention allows for the rapid exchange of tap circuitry between front and rear positions providing for the reversal of signal frequency direction. The signal tap comprises a housing frame, a back cover with a support clamp and a signal tap cover containing a plurality of
10 female F-connectors. Loss circuitry is mounted on a PC board that is attached to the tap cover.

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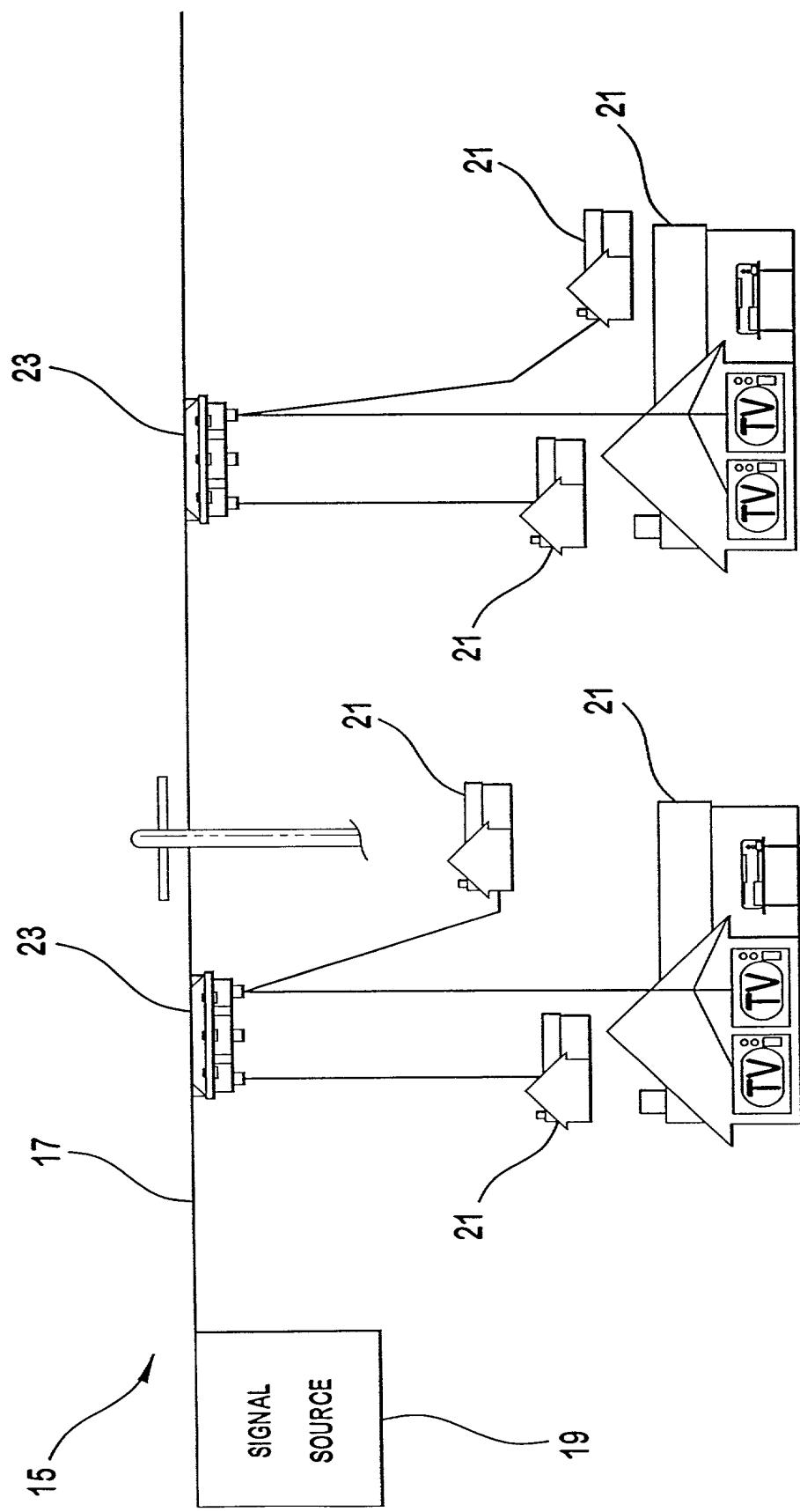


FIG. 1

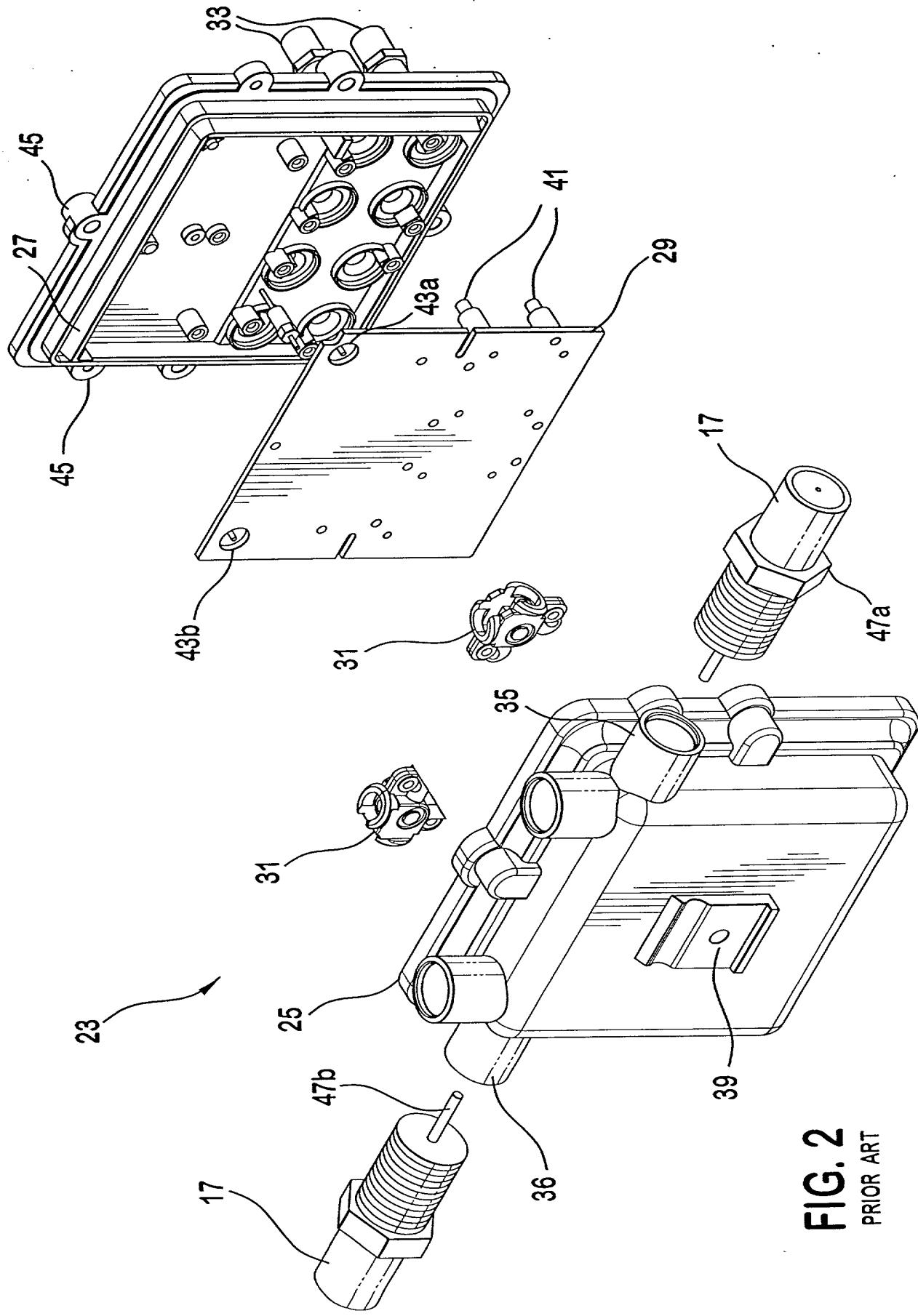
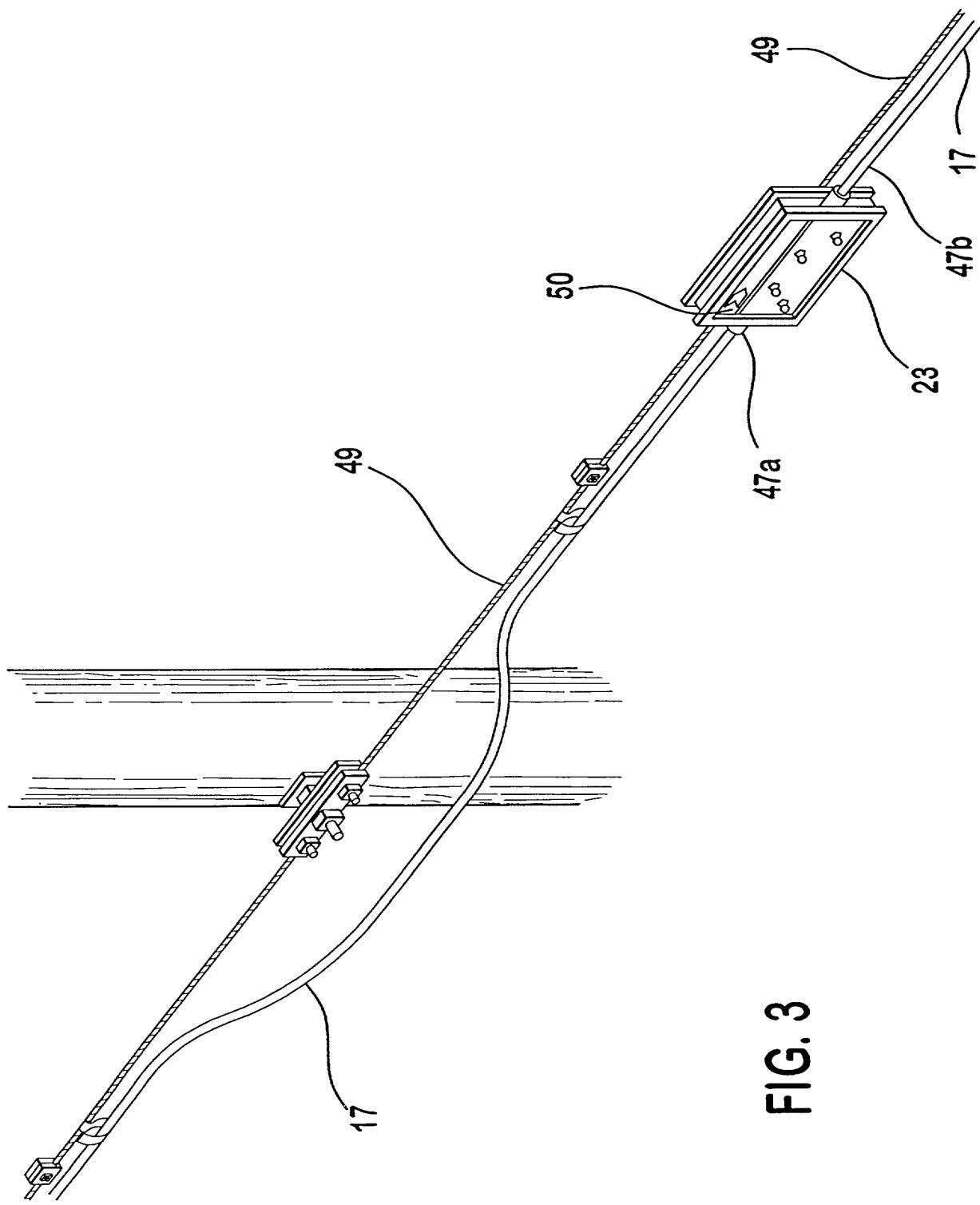


FIG. 2
PRIOR ART

FIG. 3



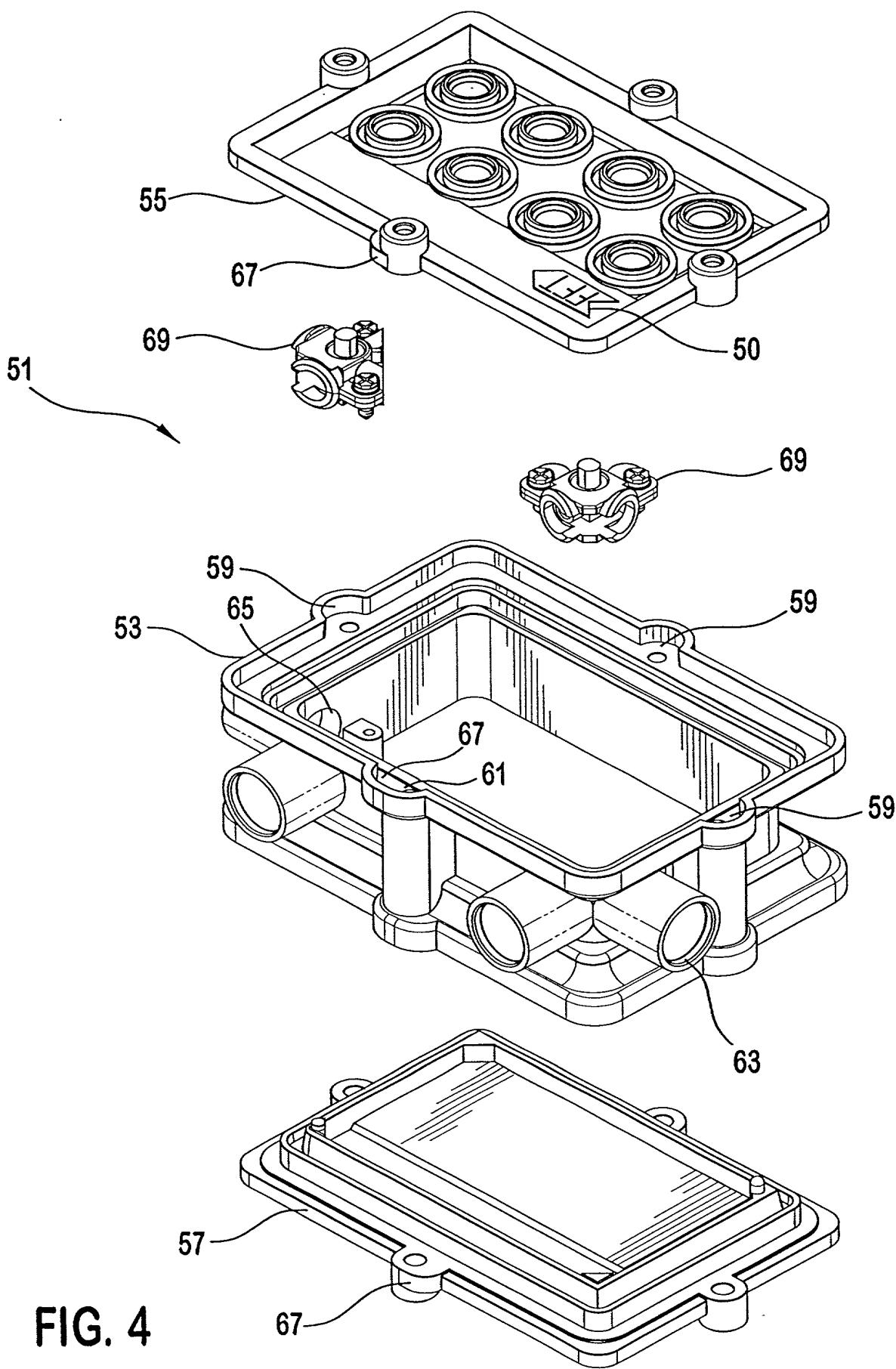


FIG. 4

FIG. 5

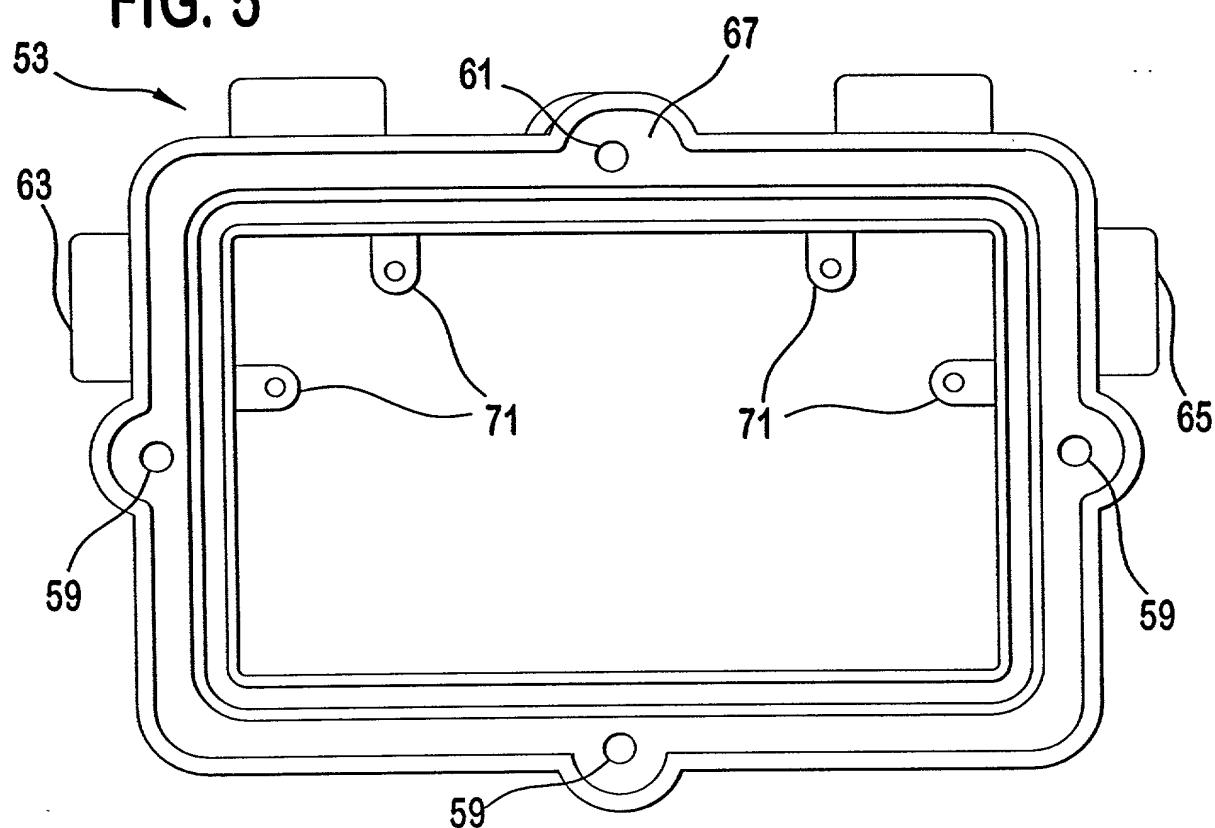
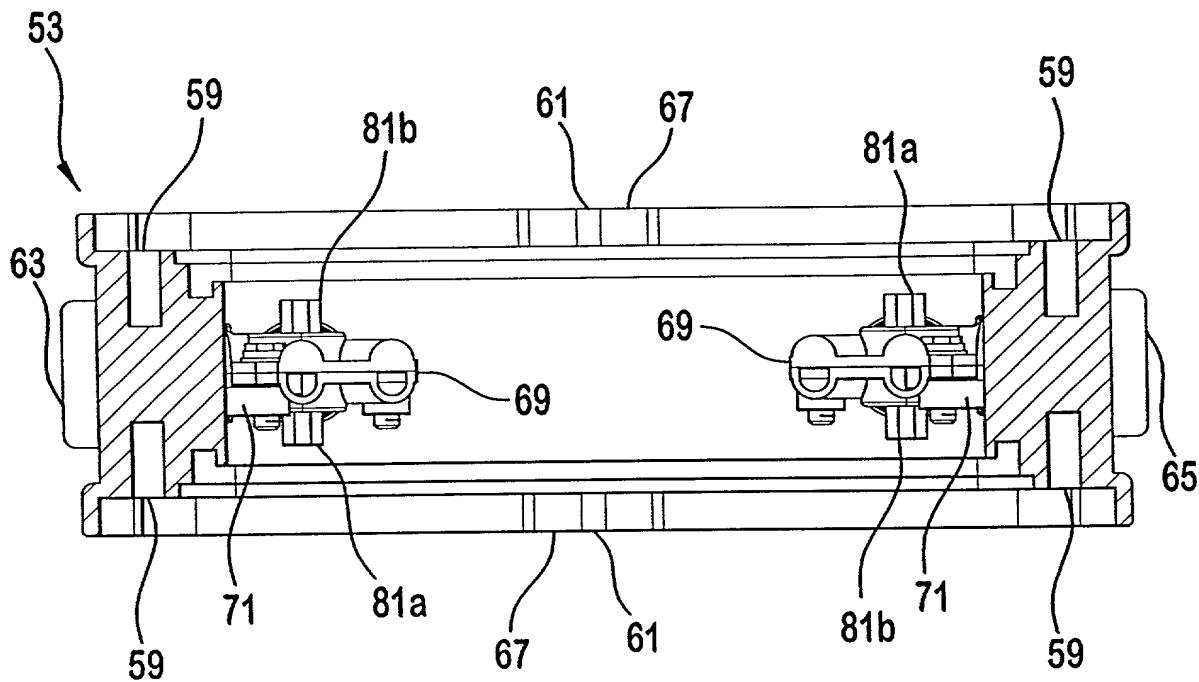


FIG. 8



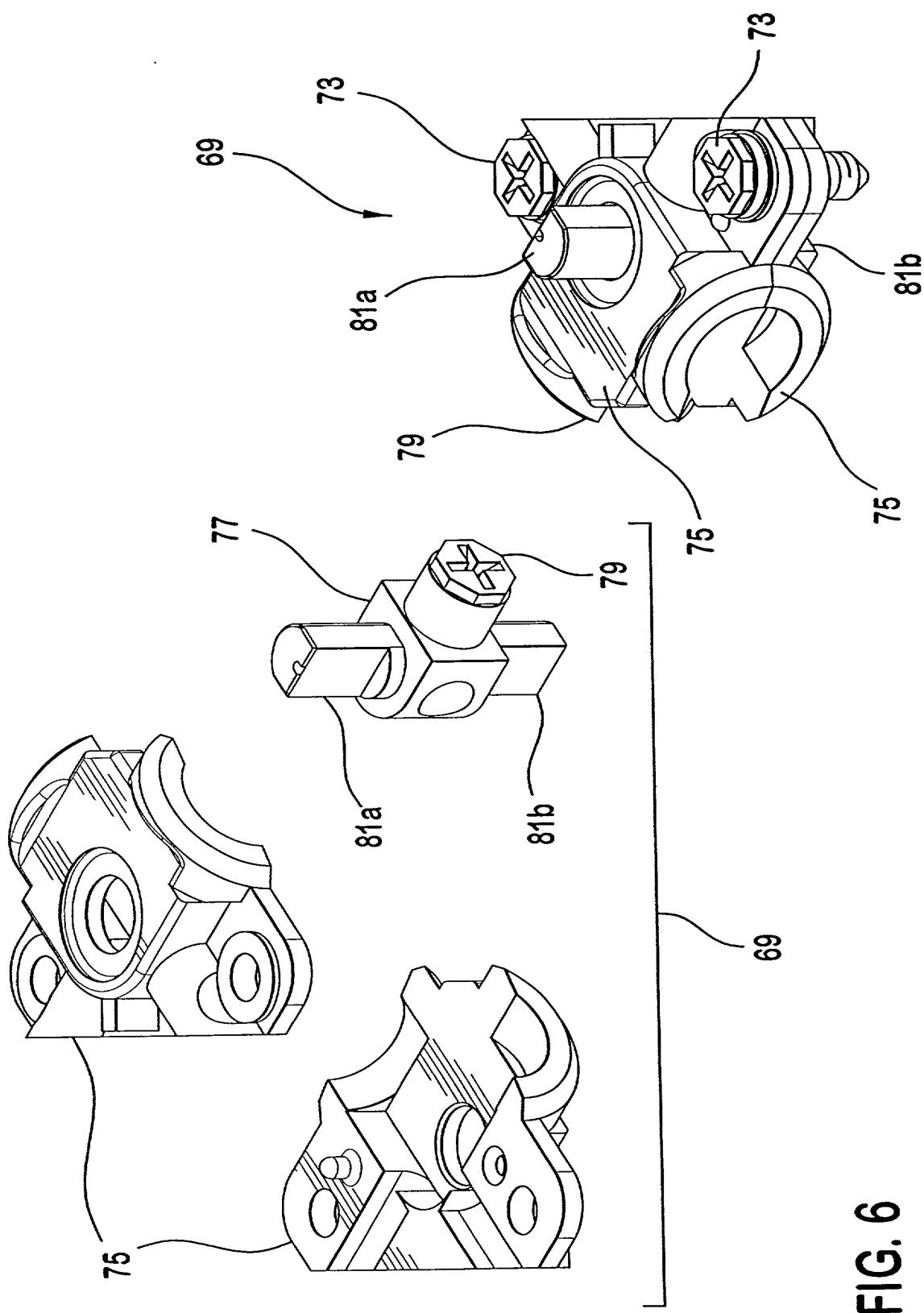


FIG. 6

FIG. 7

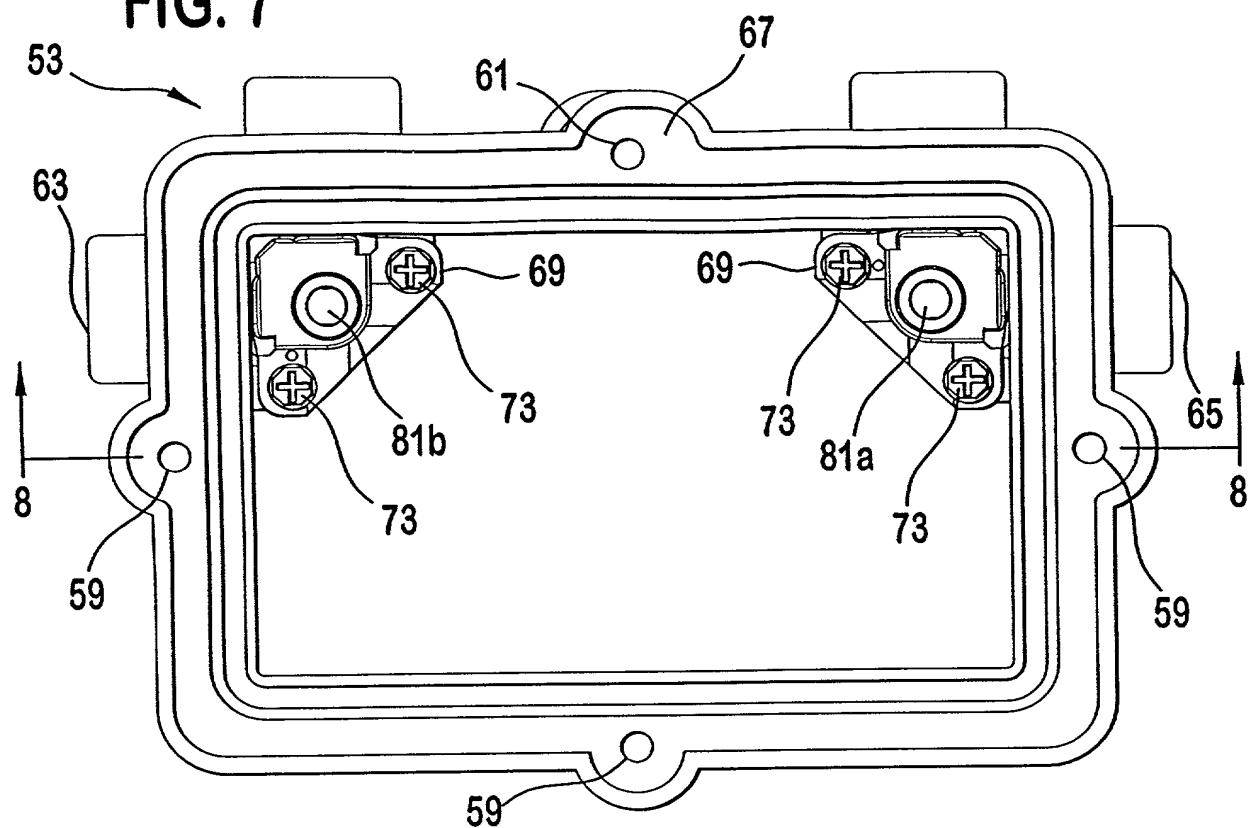
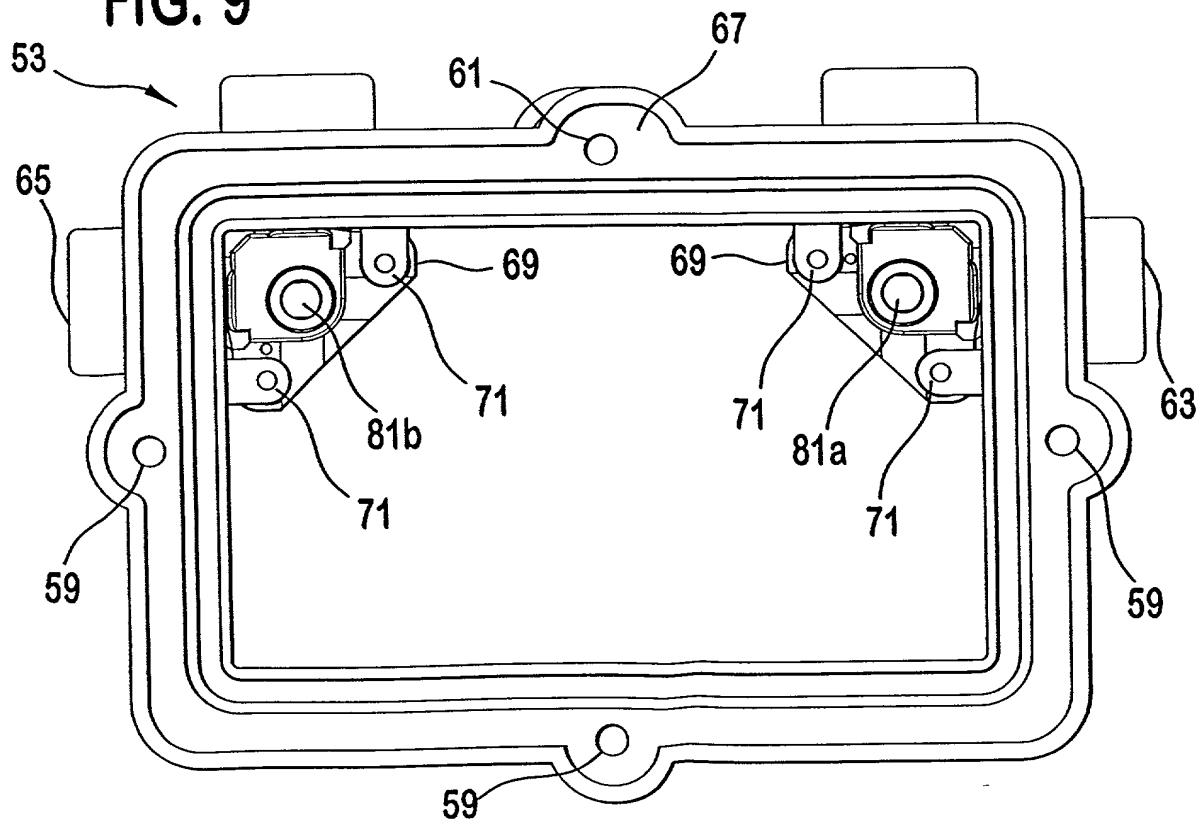


FIG. 9



PATENT
Express Mail Label No. EL102393665US

GIC-PT033
Attorney Docket No.

DECLARATION AND POWER OF ATTORNEY FOR PATENT APPLICATION

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name.

I believe I am an original, first and joint inventor of the subject matter which is claimed and for which a patent is sought on the invention entitled:

**CATV DIRECTIONAL COMPONENT WITH SIGNAL
REVERSING CAPABILITY AND METHOD,**

the specification of which is attached hereto.

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to patentability as defined in Title 37, Code of Federal Regulations, Section 1.56.

I hereby claim foreign priority benefits under Title 35, United States Code, Section 119(a)-(d) of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed: NONE

Prior Foreign Application(s) : Priority Claimed

(Number) (Country) (Day/Month/Year Filed) Yes No
(Priority Claimed)

(Number) (Country) (Day/Month/Year Filed) Yes No
(Priority Claimed)

I hereby claim the benefit under Title 35, United States Code, Section 119(e) of any United States provisional application(s) listed below. NONE

(Application Number)

(Day/Month/Year Filed)

(Application Number)

(Day/Month/Year Filed)

I hereby claim the benefit under Title 35, United States Code, Section 120 of any United States application(s) and or PCT international application(s) designating the United States of America listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application(s) in the manner provided by the first paragraph of Title 35, United States Code, Section 112, I acknowledge the duty to disclose information which is material to patentability as defined in Title 37, Code of Federal Regulations, Section 1.56 which became available between the filing date(s) of the prior application(s) and the national or PCT international filing date of this application: NONE

(Application Number) (Filing Date) (Status: patented, pending, abandoned)

(Application Number) (Filing Date) (Status: patented, pending, abandoned)

POWER OF ATTORNEY: As a named inventor(s), I hereby appoint the following attorneys and/or agents to prosecute this application and transact all business in the United States Patent and Trademark Office connected therewith.

Alfred Stapler, Esq.	16,675
Anthony S. Volpe, Esq.	28,377
C. Frederick Koenig III, Esq.	29,662
Allan H. Fried, Esq.	31,253
Gerald B. Halt, Jr., Esq.	37,633
Timothy J. Lubecki, Esq.	38,953
Glenn M. Massina, Esq.	40,081
Marilou E. Watson, Esq.	42,213
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Address all correspondence to: VOLPE and KOENIG, P.C., 400 One Penn Center, 1617 John F. Kennedy Boulevard, Philadelphia, PA 19103.

The undersigned hereby authorizes the U.S. attorney or agent named herein to accept and follow instructions from any assignee of this invention as to any action to be taken in the Patent and Trademark Office regarding this application without direct communication between the U.S. attorney or agent and the undersigned.

In the event of a change in the persons from whom instructions may be taken, the U.S. attorney or agent named herein will be so notified by the undersigned.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

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Inventor's signature: Richard Gresko Date: 1/7/99

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Full name of second joint inventor: Raymond W. Alker

Inventor's signature: Raymond W. Alker Date: 1-7-99

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Citizenship: United States of America

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Philadelphia, PA 19116